

The Effectiveness of Ethanol-based Sanitizer and Antibacterial Hand Soap on Staphylococcus aureus

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Abstract

Staph research has been collecting samples of Concordia university students since 2016 to know the nasal carriage rate of Staphylococcus aureus. This bacterium is carried by some individuals without causing any harm or a pathogen, but in some it might cause harmful diseases. Then swab was conducted to go through a series of culture tests like MSA, DNA, CNA, catalase, coagulase and gram stain to get a positive test result. Every positive test then gets tested for Methicillin-resistant Staphylococcus aureus (MRSA). Staph bacteria are usually harmless, but they can cause serious infections that can lead to sepsis or death. Methicillin-resistant Staphylococcus aureus (MRSA) is a cause of staph infection that is difficult to treat because of resistance to some antibiotics.

Background/ Method

What is Staphylococcus aureus:

Staphylococcus aureus is a germ that approximately 30% of people carry in their noses. Most of the time, S. aureus causes no harm; however, but sometimes s.aureus can cause infections that could be fatal like Bacteremia and Pneumonia.

S. aureus, how do we know?

-MSA: exhibits halophile growth as well as a color change that indicates the presence of Staphylococcus aureus.

-CNA: The presence of Staphylococcus is indicated by beta-hemolysis on a CNA agar plate.

-DNase: The presence of DNase enzyme is indicated by a pink halo around bacterial growth on a DNase agar plate.

Coagulase: The presence of the coagulase enzyme causes blood to clot, allowing Staphylococcus aureus to be identified.

Catalase: The presence of bubbles in the presence of hydrogen peroxide indicates the presence of Staphylococcus aureus catalase enzyme.

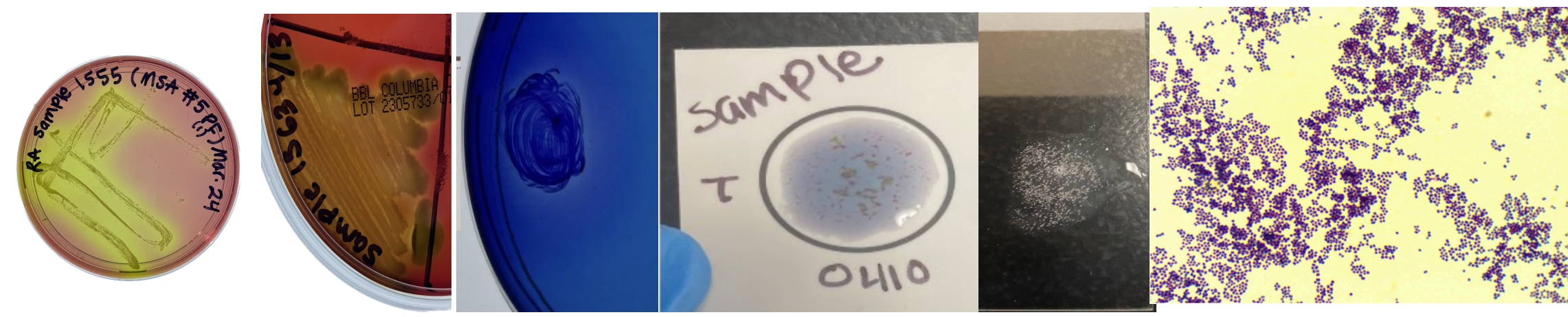
Gram Stain: When stained, Gram-negative bacteria appear will red, while Gram-positive bacteria appear purple.



Source: Organic Method to Flush Out Staph Aureus and Other Bacteria Completely

How can we confirm

Obtain all nasal swab, get them ready to go on MSA plate	From MSA to CNA to look for Beta hemolysi	Then DNase to look for the pink halo around the culture	For Coagulase test for blood clot, and for catalase test for bubble formation	Do Gram stain to look for purple circles stuck together
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Hand Hygiene and Presence of S.aureus in 200 Samples.

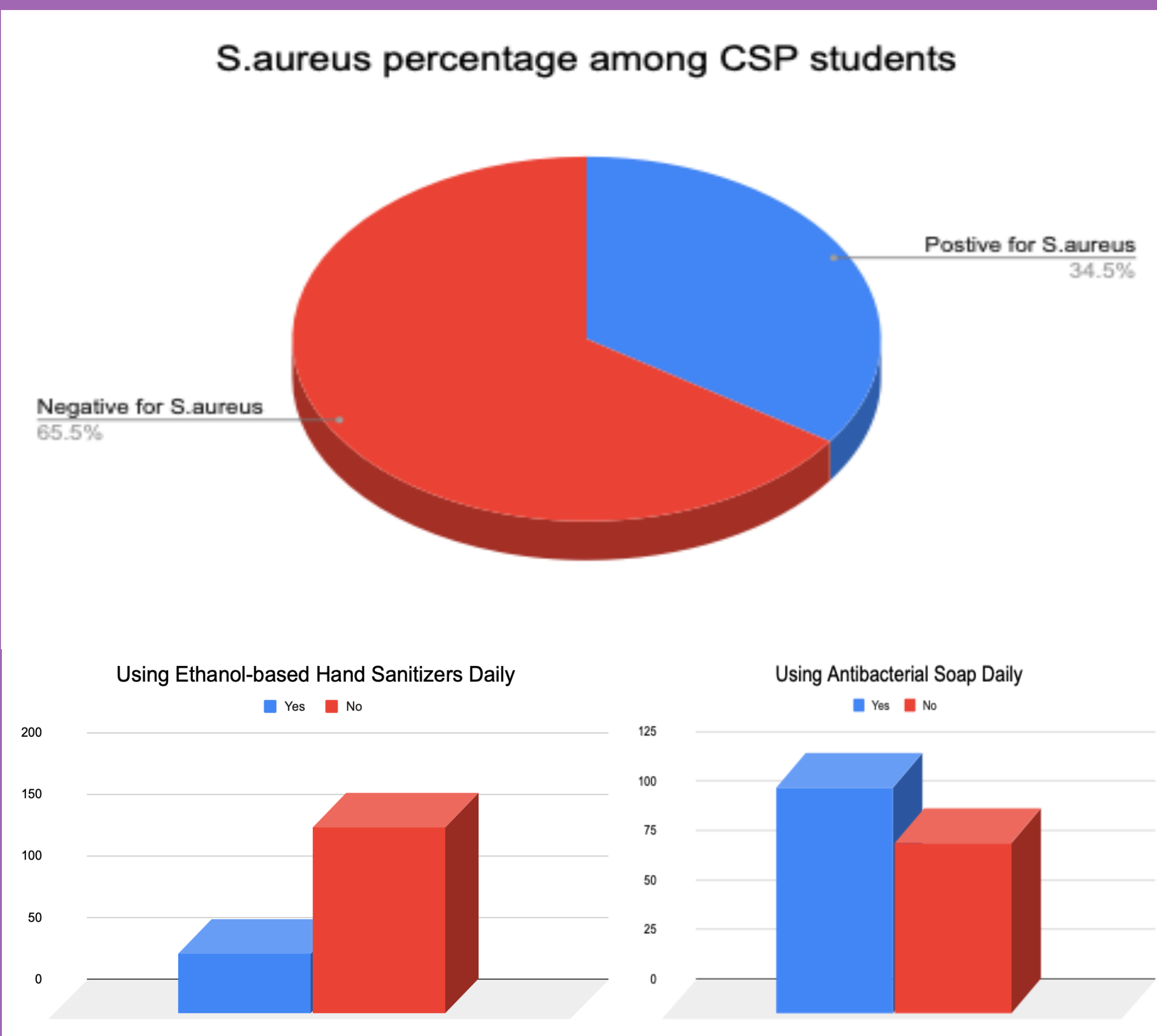
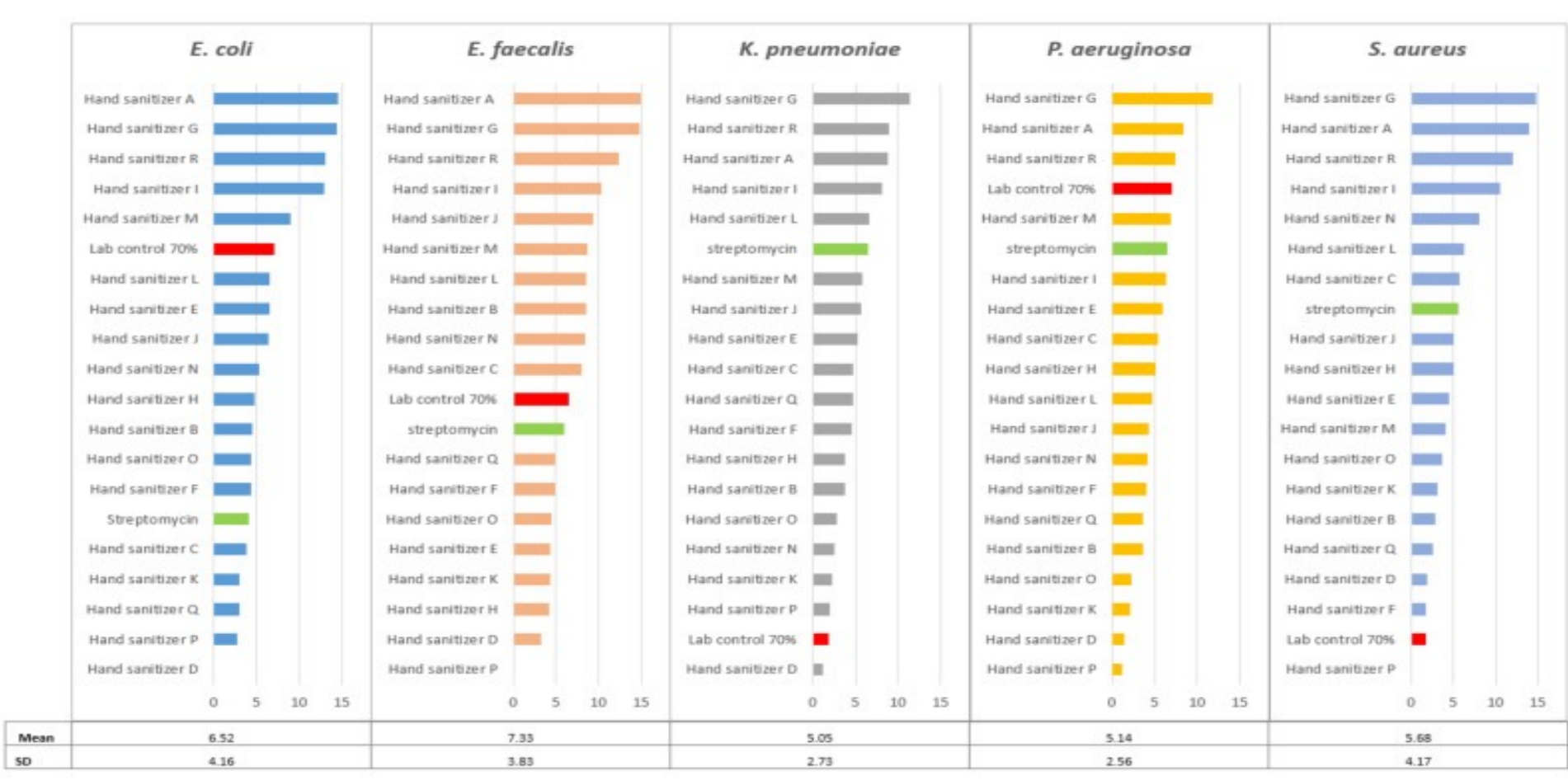


Figure 1: Breaking down the result of 200 samples from the research collection. Out of 200 samples, 69 were positive for S.aureus, while 131 were negative. This means that approximately 34.5% of the samples were positive for S.aureus, and 65.5% were negative. 49 participants said yes to using ethanol-based hand sanitizer daily and 151 said no. 114 said yes to using antibacterial soap daily and 86 said no. Therefore, the result show that the individuals who uses antibacterial hand soap have more effectiveness on reducing the presence of S.aureus, rather than the ethanol-based sanitizers. In conclusion, the data presented here provides valuable insights into the potential effectiveness of these products in reducing the presence of S.aureus. it also important to consider other factors that may influence the presence of S.aureus, such as environmental factors and personal hygiene habits.

Further research

- The article “ Assessment of Anti-Bacterial Effectiveness of Hand Sanitizers Commonly Used in South Africa” examines the effects of different types of hand sanitizers on skin microbiota and antibiotic resistance of Staphylococcus aureus.
- Antibacterial hand soap leads to a reduction in the abundance and diversity of skin microbiota.
- Ethanol sanitizer does not have a significant effect on skin microbiota.
- Antibacterial hand soap exposure leads to an increase in antibiotic resistance of Staphylococcus aureus.



Source: Assessment of Anti-Bacterial Effectiveness of Hand Sanitizers Commonly Used in South Africa.

The researchers conducted an experiment to study the effects of antibacterial hand soap and ethanol sanitizer on skin microbiota and antibiotic resistance of Staphylococcus aureus. They randomly assigned volunteers to three groups and asked them to follow a hand hygiene protocol for four weeks. The results showed that antibacterial hand soap reduced the abundance and diversity of skin microbiota and increased antibiotic resistance of Staphylococcus aureus, while ethanol sanitizer had no significant effect on skin microbiota.

Conclusion

Reduces the abundance and diversity of skin microbiota, it also increases antibiotic resistance of S. aureus. In contrast, ethanol sanitizer has no significant effect on skin microbiota. These findings suggest that careful consideration should be given to the type of hand hygiene products used to prevent the spread of antibiotic-resistant bacteria. Overall, the information presented in the poster and the findings of the article emphasize the importance of personal hygiene habits in preventing the spread of Staphylococcus aureus and antibiotic-resistant bacteria. It also highlights the need for further research to identify the most effective hand hygiene products that can prevent the spread of harmful bacteria while also preserving the diversity of the skin microbiota.

Reference and Acknowledgment

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 Muleba L, Van Wyk R, Pienaar J, Ratshikhopha E, Singh T. Assessment of Anti-Bacterial Effectiveness of Hand Sanitizers Commonly Used in South Africa. Int J Environ Res Public Health. 2022 Jul 28;19(15)